

REMARKS

Claims 1-10 and 13-20 are pending. Claims 11 and 12 are cancelled herein without prejudice or disclaimer. Claims 1 and 10 are amended herein. Support for the amendments is detailed below. New claim 20 has been added herein. Support for the new claim is at least found at pages 17-20 and Fig. 1 of the specification.

Applicants' Response to the Claim Objections

Claims 11 and 12 objected to because they are of improper dependent form for failing to further limit the subject matter of a previous claim.

The claims have been cancelled herein.

Applicants' Response to the Claim Rejections under 35 U.S.C. §103(a)

Claims 1, 4-12 and 14-19 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Ueda et al.* (JP H11-28411) in view of *Strom et al.* (US 3,762,256).

In response thereto, applicants respectfully submit that the present invention as now claimed is not obvious over the combination of Ueda and Strom for at least the reason that all the elements of the claims are not provided for, nor is there any rationale prompting a skilled artisan to modify the combination so as to derive the present invention.

Specifically, the combination of Ueda and Strom does not provide for the features of parent claims 1 and 10 requiring that a first layer comprises Cu whereas the second layer is substantially free of Cu.

The rejection relies upon Ueda for the elements as noted in the previous Office Action. Strom has been added to address the feature of the tin(Sn) range in the parent claims. Ueda is not relied upon for this aspect. The rejection specifically cites to the disclosure in Strom that a powdered brazing material consisting essentially of 5-30 wt.% tin and 70 to 95 wt.% copper, and concludes that it would have been obvious for a skilled artisan to use the Strom brazing composition as the brazing material in the composite structure of Ueda “because it is known conventional and effective alloy for brazing, especially in use with a copper base material.” Page 3 of the Office Action. However, Strom only discloses to bond Cu member and Cu (Cu cladding steel member) to each other using Cu-Sn material, but does not disclose to braze a Cu member and a Mo member with each other.

Wherefore, applicants respectfully submit that the combination of Ueda and Strom does not provide for all the features of the claims as now presented.

Further, applicants respectfully submit that there is no rationale which could prompt a skilled artisan to combine the references so as to derive the present invention. Under U.S. law, as quoted in the M.P.E.P. §2141.III.:

The Supreme Court in *KSR* noted that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit. The Court quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006), stated that “...’there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.’” *KSR*, 550 U.S. at ___, 82 USPQ2d at 1396.

The reason as set forth in the rejection is that based on Strom the use of Cu-Sn in the claimed distribution range “is a known conventional and effective alloy for brazing.” However, a

skilled artisan has no reason for utilizing a brazing material designed for an automotive brake or clutch as set forth in Strom within a Mo based heat sink for a semiconductor device. Strom does not provide a general disclosure that prompts a skilled artisan to utilize the disclosed Cu-Sn material for any brazing of Cu. Rather, Strom is specifically directed to the formation of friction compositions. Most specifically, Strom is concerned with metallurgically bonding a copper base friction material to a copper clad or copper metal plate to form a friction article useful in brakes and clutches. Col. 1, lines 19-23. The disclosed Cu-Sn brazing material is intended to braze the copper friction material to a steel under plating. See col. 3, lines 22-37. The primary concern of Strom is maintaining the bond between the Cu friction material and the back plate when subjected to extreme centrifugal force, such as that experienced by a brake or clutch. There are no disclosures within Strom related to thermal conductivity or the use of the material within a heat sink. There are no disclosures within Strom related to Mo or any possible improvement of bonding with Mo. Further, there are no disclosures within Ueda which prompt a skilled artisan to look to a brake/clutch device such as Strom.

Contrary, as set forth in the Background Art section of the current application, Mo is considered difficult to braze due to cracking and chapping. Further, other attempts at creating a brazing material which prevented the cracking and chapping disrupt the thermal conductivity of the heat sink.

Applicants have discovered that the use of the claimed Cu-Sn alloy solves both problems of preventing cracking and chapping in Mo and in allowing for improved thermal conduction. See page 5, lines 5-19 of the specification. There is no manner whereby a skilled artisan would

have derived this aspect of applicants' invention from the disclosure of Mo as a heat sink material with a semiconductor device in Ueda and Cu-Sn as a brazing material for a Cu based friction article such as an automotive brake or clutch in Strom.

Wherefore, applicants respectfully submit that the present invention as now claimed is not obvious over the combined teachings of Ueda and Strom.

Claims 4 and 13 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ueda et al. (JP H11-28411) in view of Strom et al. (US 3,762,256), as applied to claims 1 and 10 above, further in view of Sakata et al. (US 2001/0008703).

Applicants respectfully submit that by addressing the rejection of the parent claims, as noted above, likewise this rejection should be considered addressed by nature of the claims' dependencies.

New Claim

Applicants further submit that the combination of Ueda and Strom cannot result in the features of new claim 20. Most specifically, in the heat sink member disclosed in Ueda, Mo layer 11 and Cu layers 12 and 13, arranged on both sides of Mo layer 11, are formed to be in the same in size (length). See Figs. 1 and 2. Contrary, in the embodiment as depicted in Fig. 1 of the current application, the substrate 2 mainly composed of Mo is formed so that the length

thereof is smaller than that of the ply member 1. See Fig. 1. As such, at least the resulting structure of the combination of Ueda and Strom is distinguishable from that of claim 20.

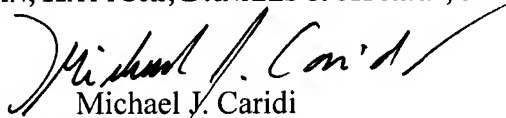
In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP

A handwritten signature in black ink, appearing to read "Michael J. Caridi", is written over the printed name and title.

Michael J. Caridi

Attorney for Applicants

Registration No. 56,171

Telephone: (202) 822-1100

Facsimile: (202) 822-1111

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